From: Murray, Maureen E
To: Russell Wasem
Subject: Re: rodenticide data
Date: Tuesday, June 25, 2013 2:01:39 PM

Hi Rusty,

As for the bromethalin screening guidance, Bob Poppenga mainly advised me on which tissue to submit for testing. Basically he advised me to test fat or brain tissue (which is very fatty) rather than liver because bromethalin is lipophilic. In my previous email I was suggesting that I could get further details on methodology of the exact assays run at the lab if you needed them. He didn't really give me general guidance on screening for bromethalin, if this is what you mean. However, if you'd like to contact Bob directly with any questions you have, I'm sure he'd be happy to help. His email is rhpoppenga@ucdavis.edu.

I don't know of any other rehabilitators or wildlife vets who are specifically screening for bromethalin, or for anticoagulants--which doesn't mean there aren't any that I'm not aware of, of course, but the testing is prohibitively expensive. When I spoke with Bob Poppenga about bromethalin I got the impression that I was looking to do something his lab didn't do much. But I certainly can suggest some rehabbers and vets who work with birds of prey whom you could contact. I have listed this info at the end of this email.

Also, I reviewed a white paper for California EPA related to their attempt to make SGARs restricted products. They included rodenticide data from a rehab center in CA. Unfortunately I don't have those materials handy, but perhaps CAL EPA can you put you in touch with that center.

On this front, I am awaiting the last installment of a small grant, which I plan to use to further investigate whether bromethalin could have been the cause of some atypical neurologic signs in a few raptors I've seen here at Tufts. It may be awhile before I have any further data, but I'll certainly let you know what I find.

I hope this is helpful. Let me know if there's other information I may be able to supply.

Best,
Maureen
--
Maureen Murray, DVM, DABVP
Clinical Assistant Professor
Wildlife Clinic
Tufts Cummings School of Veterinary Medicine
200 Westboro Rd
North Grafton MA 01536
508-839-7918

Raptor rehabilitators and veterinarians:

Marc Payne and Diane Winn (excellent bird rehabilitators with experience with raptors, based in Freedom, Maine)
Avian Haven Wild Bird Rehabilitation Center
dwmp@avianhaven.org

Dr. Patrick Redig (one of the pioneers of raptor medicine, has a great deal of experience with birds of prey)
The Raptor Center, University of Minnesota
redig001@umn.edu

Dr. Dave McRuer (veterinary director of large wildlife rehab center that treats raptors)
Wildlife Center of Virginia
dmcruer@wildlifecenter.org

Dr. Dave Scott (staff vet at a raptor rehab center)
Carolina Raptor Center
dscott@carolinaraptorcenter.org

On 6/25/13 11:22 AM, "Russell Wasem" <Wasem.Russell@epa.gov> wrote:

>Good Afternoon Maureen,
>
>Previously you mentioned being able to obtain details on the bromethalin
>screening guidance provided by Bob Poppenga. Is this something you can
>still obtain? If you like, I can contact him directly, cc you and ask him
>for it.
>
>Also, I am looking to get in touch with other wildlife rehabilitators who
>have experienced treating animals that have been exposed to rodenticides.
> Can you share the names and contacts that you think would be willing to
>talk to me about this topic? It would also be interesting to know who
>else Dr. Poppenga has shared his bromethalin screening guidance to find
>out about their experience and whether they have been able to detect
>bromethalin residues in wildlife under the new guidance.
>
>Thank you in advance for any assistance you are able to provide.
>
>Regards,
>Rusty
>
>-----Original Message-----
>From: Murray, Maureen E [mailto:Maureen.Murray@tufts.edu]
>Sent: Tuesday, May 07, 2013 2:30 PM
>To: Russell Wasem
>Cc: Mastrota, Nicholas; Miller, Robert; Parsons, Laura; Housenger,
>Justin; Anderson, Brian
>Subject: RE: rodenticide data
>
>Hello Rusty,
>
>Here is the newest bird of prey rodenticide screening data I have. My
>goal in collecting these data originally had been to see if I could

>detect a change in what these birds were exposed to following the risk
>mitigation measures. Of course, given the non-compliance issue, the data
>don't truly reflect the effectiveness or consequences of the RMD, but I
>hope they may be of some use. Although this data set is small, it's
>probably safe to say that there's still a lot of brodifacoum out there.
>
>An excel spreadsheet is attached. The abbreviations used for the species
>of birds in the spreadsheet are: RTHA: red-tailed hawk, EASO: eastern
>screech owl, BDOW: barred owl. Birds in which I diagnosed the cause of
>death as rodenticide poisoning are highlighted in bold. Also attached is
>a map showing the locations where the birds were recovered at the
>city/town level.
>
>Below I have addressed each of your questions individually. Please let me
>know if there is anything that requires further clarification or if there
>are other questions I can address.
>
>Maureen
>
>Maureen Murray, DVM, Dipl ABVP-Avian
>Clinical Assistant Professor
>Wildlife Clinic
>Tufts Cummings School of Veterinary Medicine
>200 Westboro Rd
>North Grafton MA 01536
>508-839-7918
>
>
>(1) Identification and concentration of the chemical(s):
>See spreadsheet.
>
>(2) Location and condition of the animal when found:
>See spreadsheet. All cities and towns are in Massachusetts. Most birds
>were presented to Tufts Wildlife Clinic alive (with exceptions noted as
>"dead on arrival"). Whether the bird died or was euthanized, along with
>the reason for death or euthanasia are noted in the spreadsheet.
>
>The attached map shows the locations where the birds were recovered at
>the city/town level (not exact location within the city/town) to give a
>general idea of where the samples are from.
>
>(3) Any general information regarding exposure if known -Any evidence
>that any bird consumed a house mouse, Norway rat or roof rat
>(irrespective of whether the rodent might have been carrying
>rodenticides)?
>All birds in this data set, except one, had no stomach contents present
>at the time of necropsy, so unfortunately I cannot address this question.
>The one bird that did have prey in its gizzard at the time of death was a
>red-tailed hawk in which I diagnosed the cause of death as anticoagulant
>rodenticide poisoning. This bird had a snake in its gizzard. This is
>noted in the spreadsheet.
>
>(4) Information on the chemical screen methods used to identify the
>chemical (what chemicals were screened - FGARs or bromethalin?) I
>screened for FGARs (including chlorophacinone and diphacinone) and SGARs
>as well as for bromethalin. I did not detect FGARs or bromethalin. Liver
>tissue was tested for FGARs/SGARs. The tissue tested for bromethalin is
>noted in the spreadsheet. The toxicologist with whom I worked (Dr. Bob
>Poppenga at California Animal Health and Food Safety lab at UC Davis) had
>suggested fat as the best tissue to screen for bromethalin. Some birds

>were too emaciated to obtain fat, so in these birds brain was screened.
>The samples for bromethalin testing were protected from light. Specific
>details on methodology I can obtain from Dr. Poppenga if you need them.
>
>I should note that although I did not detect FGARs or bromethalin, I do
>not know how widely used these products are in this area at this point.
>So whether these negative findings reflect a lack of use (given that
>consumers can still purchase brodifacoum products) or provide support for
>FGARs and bromethalin potentially posing less risk to birds of prey
>cannot be determined without continued testing once FGARs and bromethalin
>are the only products on the consumer market. Also, I am waiting for
>histopathology results on one bird that had unusual neurologic signs to
>rule out evidence of bromethalin toxicosis in spite of the negative lab
>result.
>
>(5) Methods for identifying the poisoned animals (chance encounters,
>animals brought to clinic , etc) -Did you test all animals you were
>presented? If no, what was the decision process for determining which
>animals were analyzed?
>
>The methods were identical to those used in my 2011 study. In summary, I
>chose to sample 4 species of birds of prey commonly seen at the Tufts
>Wildlife Clinic (red-tailed hawks, barred owls, great horned owls,
>eastern screech owls). These are the same 4 species in the 2011 study,
>which I chose to screen again with the aim of comparing pre- and post-
>2011 data in the same 4 species. The birds were all brought to the Clinic
>because they were injured or ill. I sampled all birds of these species
>that died or were euthanized due to their injury or illness, so I sampled
>regardless of the presence of signs of rodenticide poisoning. In the
>recent data, there are no great horned owls represented because none died
>or were euthanized at the Clinic during the sampling period. The total
>number of birds was dictated entirely by available funds. (Funding was
>from a grant through a private organization, the Animal Welfare
>Institute.)
>
>(6) Did the species distribution seem consistent with the local large
>raptor population? Were any species notably over- or under-represented?
>As noted above, I chose to focus on 4 species commonly seen at the Tufts
>Wildlife Clinic, of which 3 are represented in these data. All 3 species
>were highly exposed to SGARs, with 18/20 birds positive.
>
>(7)How did 2012-2013 compare to 2006-2011? Does she see any differences
>over time w/r/t AIs, species, etc.?
>The 2012-2013 data set is small-only 20 birds compared to 161 birds for
>2006-2010. Keeping this in mind, the new data shows continued high
>exposure to SGARs (86% of total birds in 2006-2010; 90% of total birds in
>2012-2013). In both data sets, all species tested show high exposure. In
>the new data, brodifacoum was present in all positive birds.
>
>One difference I see is in the numbers of birds with exposure to multiple
>SGARs in the new data. In the 2006-2010 data, 136/139 positive birds had
>residues of brodifacoum only. One bird had residues of bromadiolone
>only. Just two birds had residues of both brodifacoum and difethialone.
>However, in the new data 7/18 positive birds have residues of 2 or more
>SGARs (details in spreadsheet).
>
>In looking at the location information in relation to birds with residues
>of multiple SGARs, those with multiple residues tend to be from more
>urban areas (around Boston, also Lynn and Lowell which are urban areas,
>and Foxboro which is the location of the stadium where the New England

>Patriots play). Those with residues of brodifacoum only are predominantly
>from suburbs west of Boston. The two negative birds are from towns around
>the Quabbin Reservoir (the water supply for the city of Boston), which is
>a less developed area.
>
>My presumption is that the exposure in the western suburbs is from
>homeowner use; however, whether this use reflects homeowners still using
>store-bought products containing brodifacoum or homeowners employing
>licensed applicators using brodifacoum cannot be determined.
>
>_____
>From: Russell Wasem [Wasem.Russell@epa.gov]
>Sent: Wednesday, May 01, 2013 9:00 AM
>To: Murray, Maureen E
>Cc: Mastrota, Nicholas; Miller, Robert; Parsons, Laura; Housenger,
>Justin; Anderson, Brian
>Subject: RE: rodenticide data
>
>Good Morning Dr. Murray,
>
>We greatly appreciate your offer. After conferring with the team on your
>offer, so much was requested I am tempted to ask for everything. I was
>also told you can email the incident information directly to my
>colleagues that manage the EIIS system (Those cc'ed, minus Laura and
>Brian).
>
>Specifically if you are able and willing to provide, we are interested in
>the following additional information:
>
>(1) Identification and concentration of the chemical(s)
>
>(2) Location and condition of the animal when found
>
>(3) Any general information regarding exposure if known -Any evidence
>that any bird consumed a house mouse, Norway rat or roof rat
>(irrespective of whether the rodent might have been carrying
>rodenticides)?
>
>(4) Information on the chemical screen methods used to identify the
>chemical (what chemicals were screened - FGARs or bromethalin?)
>
>(5) Methods for identifying the poisoned animals (chance encounters,
>animals brought to clinic , etc).
>-Did you test all animals you were presented? If no, what was the
>decision process for determining which animals were analyzed?
>
>(6) Did the species distribution seem consistent with the local large
>raptor population? Were any species notably over- or under-represented?
>
>(7) How did 2012-2013 compare to 2006-2011? Does she see any differences
>over time w/r/t AIs, species, etc.?
>
>
>Regards,
>Rusty
>
>540-846-5828
>
>-----Original Message-----
>From: Murray, Maureen E [mailto:Maureen.Murray@tufts.edu]

>Sent: Tuesday, April 30, 2013 2:30 PM
>To: Russell Wasem
>Subject: rodenticide data
>
>Hello Mr. Wasem,
>
>I was a member of the 2011 FIFRA SAP on rodenticides. I have a limited
>amount of new data I collected as a follow up to my 2011 study on
>anticoagulant rodenticides in birds of prey (Murray, M. Anticoagulant
>rodenticide exposure and toxicosis in four species of birds of prey
>presented to a wildlife clinic in Massachusetts, 2006-2010. J Zoo Wildl
>Med. 2011;42(1):88-97). In summary, I tested 20 raptors between Oct 2012
>and Feb 2013; 18 (90%) were positive for SGARs; 3 (15%) died from SGAR
>toxicosis. I'm wondering, since it will be a while before I can publish,
>if it would be useful to supply this data directly to you? I am happy to
>send you additional details (SGARs identified and concentrations) if this
>would be of interest. Otherwise I will submit the information through the
>incident reporting system.
>
>Regards,
>
>
>